

## **REMARKS**

Claims 24-29 and 31-33 are pending in this application, claim 30 having been cancelled by this amendment. Reconsideration in view of the following amendments and remarks is kindly requested.

### **Claim Rejections – 35 U.S.C. §112**

Pending claims 24, 26, 28-29 and 32 were rejected under the second paragraph of 35 U.S.C. §112 as allegedly being vague and indefinite. Applicants have amended claims 24, 26, 28-29 and 32 in an effort to comply with the second paragraph of 35 U.S.C. §112, taking into account the Examiner's suggestions and comments.

### **Claim Rejections – 35 U.S.C. §103**

Claims 24-33 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over any of Aoyama et al. (USP 5,432,829), Orii et al. (USP 6,735,267) or Koyama et al. (USP 6,335,956) in view of Ueda et al. (USP 5,068,082) and Johansson et al. (USP 5,229,068). This rejection is respectfully traversed.

Initially, claim 30 has been cancelled, the rejection as to this claim is now moot. As to claim 24, Applicants submit none of Aoyama et al., Orii et al. or Koyama et al. teach or suggest of a fuel bundle for a boiling water reactor, comprising, at least:

a plurality of fuel rods including full-length rods and part-length rods within the tube around the water passages, the part-length rods further comprising:

a first part-length rod group including two rod subsets in a mirror-image relationship along the centerline between the two water passages, each subset further comprising three part-length fuel rods in a triangular orientation with one rod of the subset closer to the longitudinal centerline between the two water passages than the other two rods of the subset and directly adjacent to the other two rods of the subset, and

a second part-length rod group including four pairs of part-length rods, each part-length rod pair centrally located in the outermost row of the 10x10, 9x9 or 8x8 matrix adjacent a corresponding one of the four sides of the tube. (underlining for emphasis)

In Orii et al., referring to Fig. 2 and Fig. 11, there is only shown circular-shaped and square-shaped water passages

There is thus no teaching of a first part-length rod group with two short-length fuel rod subsets, each subset comprised of three short-length rods in a triangular orientation with one rod of the subset closer to the longitudinal centerline between the two water passages than the other two rods [see Fig. 2] and directly adjacent to the other two rods of the subset. There is further no teaching in combination with the above arrangement of part-fuel rod subsets as claimed, of a second part-length rod group including four pairs of part-length rods, each intermediate-length rod pair centrally located in the outermost row at the 10x10, 9x9 or 8x8 adjacent to a corresponding one of the four sides of the tube.

Even though it is alleged in the office action that “short length fuel rods may be differently arranged from the arrangement of Fig. 21 if the short length fuel rods are arranged both in the positions in the outermost tier and in positions adjacent to the water rods,” Applicants have not found further variations in Oriti et al., which would read on the features of claim 24 as recited above.

Of the figures relied on by the Examiner in Koyama et al. (Figs. 11 and 12) and in Aoyama et al. (Figs 8 and 21), none teach or suggest either of the above features in claim 24.

Relying on figures in Ueda et al. (Figs. 19 and 25), the Examiner alleges that the claimed configuration of part-length rods may be considered a matter of design choice. Also, the Examiner, relying on Johansson et al., alleges that the number of part-length rods is a matter of optimization within prior art conditions or through routine experimentation. It is further alleged that Applicants have not shown how the 3-rod group is functionally distinct from the 2-rod group, or that the 2-rod group is an obvious variant.

Applicants submit that this is not the test for obviousness. The Examiner has merely inserted his own opinion, viewing the claimed invention in hindsight, in alleging that it would be obvious to one of ordinary skill in the art to utilize the aforementioned arrangement in the Oriti et al. Oriti et al does not provide any such teaching or suggestion. Use of such hindsight reconstruction is improper and ignores specific limitations of the claims (MPEP 2143.03). In any case, Ueda et al. and Johansson et al. are inapplicable to amended claim 24 for at least these reasons, and further for the

reason that neither reference teaches or suggests the amended features in claim 24, which are also absent in Orii et al.

Absent the Examiner finding this specific recited configuration in Ueda et al. and Johansson et al, Ueda et al and Johansson et al. fail to cure the deficiencies present in each of Orii et al., Koyama et al. and/or Aoyama et al. For at least this additional reason, claim 24 is allowable over the art of record, as the combination of references fail to teach each and every feature recited in amended claim 24. **Should the Examiner be of the opinion that claim 24 requires further clarification of the claim language, Applicants welcome the Examiner's comments and suggestions.**

Claims 25-27 are allowable by virtue of their dependency on claim 24, submitted to be in condition for allowance.

Claim 28 recites, inter alia, wherein the "10X10 fuel-rod matrix includes two, three-rod subsets in a mirror image relationship with one another along the longitudinal centerline between the two water passages, each three-rod subset configured in a triangular orientation and directly adjacent to the pair of water passages such that one rod of the 3-rod subset is closer to the centerline than the other two rods. Absent the Examiner finding this specific claimed configuration in the cited references (which Applicants submit do not exist in any of the cited references) claim 28 is allowable over the art of record, at least for the above-noted features. Claim 29 is allowable by virtue of its dependency on claim 28.

As to claim 31, Applicants submit that none of Aoyama et al., Orii et al. or Koyama et al. teach or suggest of a fuel bundle for a boiling water reactor, comprising, at least:

the 10X10 fuel-rod matrix consists of a first rod group comprising two pairs of part-length rods arranged on either side of a corner of the square water-passage, and a second rod group consisting of two pairs of part-length rods and at least two non-paired part-length rods, each of the two pairs and the at least two non-paired part-length rods located in a corresponding outermost row or column of the matrix adjacent a corresponding side of the tube.

In Orii et al. (Fig. 11 appears most relevant), there is shown only a square water-passage.

There is thus no teaching of two pairs of part-length rods arranged on either side of a corner of the square water-passage. There is further no teaching of two pairs of part-length rods and at least two non-paired part-length rods located in a corresponding outermost row or column of the matrix adjacent a corresponding side of the tube.

Of the figures relied on the Examiner in Koyama et al. (Figs 11 and 12) and Aoyama et al. (Figs 8 and 21), none teach or suggest either of the above features in claim 31. Ueda et al. and Johansson et al., relied by the Examiner, do not make up for the deficiencies of the primary references. Accordingly, claims 31 is allowable over the art of record, at least for the above-noted features. Claims 32-33 are allowable by virtue of its dependency on claim 31.

### CONCLUSION

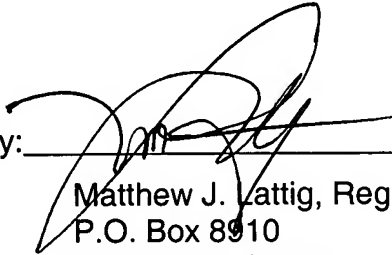
Accordingly, in view of the above remarks and amendments, reconsideration of all outstanding rejections and allowance of each of claims 21-26 and 28-32 in connection with the present application is earnestly solicited.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned at (703) 668-8026 (direct).

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge any underpayment or non-payment of any fees required under 37 C.F.R. §§ 1.16 or 1.17, or credit any overpayment of such fees, to Deposit Account No. 08-0750, including, in particular, extension of time fees.

Respectfully submitted,  
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By: \_\_\_\_\_

  
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